

Amendments to the Claims

This listing of claims will replace all prior versions and listing of claims in the application.

1. (Currently Amended) An apparatus for detecting substances or analytes from the analysis of one or several samples, comprising:

a sample homogenizer module ~~capable of acting on the~~ a sample contained in a container to produce the homogenization thereof;

a sample processing module including a series of independent containers, each one of which is intended for receiving one of the samples to be analyzed;

a reaction module including a series of reaction chambers, as many as there are containers included in the sample processing module, each one of which is communicated with one of said containers through a controlled passage conduit and includes a sensor system for detecting substances;

a sample distribution module including a hopper or funnel with a fixed position in which samples to be analyzed are poured, the sample distribution module being responsible for adding or distributing samples to a chosen processing module container or containers and for bringing samples contained in a chosen container into contact with the sample homogenizer module and is fed by sample injectors from samples stored in multiwell plates;

a reagent and solution management module storing and dispensing the reagents and solutions necessary in each process step;

a data reading module through which the reactions occurring in the reaction chambers are detected and the detected signals are processed; and

an overall controller supervising the process and each ~~and every one of the modules of the invention~~ sample homogenizer module, sample processing module, reaction module, sample distribution module, reagent and solution management module, and data reading module.

2-4. (Cancelled)

5. (Currently Amended) An apparatus according to claim 1, wherein the sample distribution module includes a rotating drum in which the sample processing module containers are assembled and are rotational about a vertical or horizontal shaft, which drum is capable of always placing a chosen container in communication with the hopper or funnel and, subsequently, with [[the]] a sample processing module piston.

6-7. (Cancelled)

8. (Currently Amended) An apparatus according to claim 1, wherein the reaction module chambers are assembled in [[the]] a rotating drum of the sample distribution module.

9. (Previously Presented) An apparatus according to claim 1, wherein the sample processing module further comprises means for closing the container housing the samples to be analyzed during the processing of said sample, which means consist of a piston assembled in a rack located above the rotating drum and under which the different containers can be placed by means of the rotation of said drum, the rack being movable in the longitudinal direction between a top open position and another bottom closed position of the container placed immediately underneath.

10. (Previously Presented) An apparatus according to claim 1, wherein the sample processing module further comprises means for closing the container housing the samples to be analyzed during the processing of said samples, which means consist of a piston assembled on a rack placed on one side of the rotating drum and opposite which the different containers may be arranged, placed on the other side of the drum as a result of the rotation of said drum, the rack being moveable between an open position and a closed position.

11. (Previously Presented) An apparatus according to claim 1, wherein each one of the sample processing module containers further comprises means for the closing thereof, which means consist of a piston or valve assembled in each container and actuated by the movement of the homogenization module moving rack.

12. (Previously Presented) An apparatus according to claim 1, wherein each sample processing module container includes one or more main homogenization chambers and one or more independent secondary chambers intended for containing the reagents, intercommunicated with the main chamber, said main chamber being open so as to receive the sample to be analyzed and the closing means, and having a bottom port with a filter and a flow valve, through which the homogenized sample is injected into the reaction module.

13. (Currently Amended) An apparatus according to claim 12, wherein the wall of the main chamber has a venting port located above the intercommunication ports with the secondary chambers, determining the moment of the hermetic sealing of said chamber by [[the]] a piston when said port is surpassed by a gasket of the piston, said piston being movable inside the main chamber from the hermetic sealing position so as to cause the pressure inside said chamber to increase.

14. (Previously Presented) An apparatus according to claim 13, wherein the sample introduction into the main chamber is carried out through the venting port.

15. (Previously Presented) An apparatus according to claim 12, wherein the secondary chambers are closed at the top and bottom parts by means of caps through which cannulas belonging to the reagent management module for injecting reagents or solutions, or which carry pressure or temperature sensors, or sensors for other physicochemical parameters, can be introduced.

16. (Currently Amended) An apparatus according to claim 12, wherein the flow valve located between the main chamber of each sample processing module container and the reaction module chamber consists of a non-return ~~value~~ valve, the closing of which occurs when an overpressure is created in the reaction module chamber with respect to the sample processing module main chamber.

17. (Previously Presented) An apparatus according to claim 9, wherein the sample processing module rack is assembled on the sample distribution module movement shaft, on one of the sides of said module, without rotational ability but with the ability to slide thereon between end positions determined by a sensor.

18. (Previously Presented) An apparatus according to claim 10, wherein the rack is assembled on guides along which it can move, on one side of the rotating drum and with no rotational ability, by means of a linear actuator with a linear potentiometer.

19. (Currently Amended) An apparatus according to claim 1, wherein ~~[[the]]~~ a longitudinally moving rack includes the sample homogenization means, which consist of a device with thermal or mechanical action or a wave generator capable of acting on the samples.

20. (Previously Presented) An apparatus according to claim 10, wherein said piston has a tubular structure and the sample homogenization device acts through it.

21. (Currently Amended) An apparatus according to claim 1, wherein the reaction module comprises, for each sample processing module container, a body defining an internal reaction chamber having an inlet connected to ~~[[the]]~~ a main chamber of said container through ~~[[the]]~~ a non-return valve, an inlet connected to ~~[[the]]~~ a secondary chamber of said container through which a washing solution is injected, and a solution outlet to a waste deposit; one of the walls of

said chamber carrying the sensor system ~~responsible~~ configured for detecting [[the]] substances present in the homogenized solution or suspension injected in the chamber.

22. (Previously Presented) An apparatus according to claim 1, wherein the reagent and solution management module comprises at least one motorized syringe responsible for storing and dispensing fluids which is accompanied by a linear actuator actuating the syringe plunger rod, a position sensor to obtain the position of the plunger, a non-return valve and an injection cannula fixed to the sample processing module moving frame.

23. (Previously Presented) An apparatus according to claim 22, wherein it comprises a series of reagent and solution deposits, there being the same number of deposits as different reagents and solutions are needed, and at least one pumping device capable of aspirating the fluids from the different deposits and dispensing them into the homogenization or reaction chamber.

24. (Previously Presented) An apparatus according to claim 1, wherein the reaction module is made up of a receptacle to house a biosensor that includes a system of stirring or moving the liquid sample so as to improve the working of said biosensor, which has at least one inlet port for the sample coming from the sample processing module container, at least one inlet port for additional liquid solutions, and at least one outlet port for the different solutions and pipes or conduits that are necessary and are connected by a conduit where a pumping system is arranged which allows recirculating the sample on the biosensor.

25-26. (Cancelled)

27. (Previously Presented) An apparatus according to claim 24, wherein said biosensor is formed by detecting substances immobilized on a solid support in the form of a microarray or biochip, distributed in flow channels or chambers.

28. (Currently Amended) An apparatus according to claim 1, wherein the data reading module comprises a reaction detector including a light source that may be monochromatic or not, for energizing the biosensor and ~~a suitable radiation detection system~~ is a CCD camera coupled to filters to detect only the appropriate radiation.

29. (Cancelled)

30. (Previously Presented) An apparatus according to claim 28, wherein the monochromatic light is guided by means of a waveguide in which the biosensor is located, which biosensor is energized as a result of the evanescent modes forming on the outer surface of said guide.

31. (Currently Amended) An apparatus according to claim 1, ~~wherein it comprises further~~ comprising a cage-shaped structure assembled in which there is a central vertical column, which defines the rotation shaft of ~~[[the]]~~ a sample distribution module rotating drum, and along which column the sample processing module rack can slide, the sample acquisition module hopper or funnel, the reagent management module and the data reading module being assembled in said cage-shaped structure.

32. (Currently Amended) An apparatus according to claim 1, ~~wherein it comprises further~~ comprising a cage-shaped structure assembled in which, according to a horizontal shaft, is the sample distribution module rotating drum and parallel to said shaft, the guides through which the sample processing module rack slides, the sample acquisition module hopper or funnel, the reagent management module, the data reading module and the communication and control modules also being assembled in said cage-shaped structure.

33. (Withdrawn) A method for detecting substances or analytes from the analysis of one or more samples, wherein it comprises the steps of: a) mixing said sample with a suitable liquid buffer; b) homogenizing with a homogenizing system; c) adding reagents to modify said sample;

d) filtering the sample; e) injecting said sample in a reaction chamber; f) allowing the sample to react with a biosensor; g) washing the non-reacted sample excess; and h) detecting the sample retained in the biosensor.

34. (Withdrawn) A method according to claim 33, wherein the suitable liquid buffer is a saline solution.

35. (Withdrawn) A method according to claim 33, wherein the liquid buffer has a sample marker compound.

36. (Withdrawn) A method according to claim 33, wherein the marker compound excess is blocked with a blocker compound.

37. (Withdrawn) A method according to claim 33, wherein the biosensor consists of at least one substance capable of specifically binding to another substance.

38. (Withdrawn) A method according to claim 37, wherein the substance or substances capable of specifically binding to another or to other substances are chosen from the group formed by: a) a substance of an amino acid nature; b) a substance of a proteinaceous nature; c) a substance of a nucleotide nature; d) a nucleic acid; e) a peptide-nucleic acid (PNA); f) a substance of a lipid nature; g) a substance of a saccharide nature; h) a substance that is the combination of at least two of the previous ones; j) a live whole cell; j) a whole cell in the form of a spore; k) a cell extract or lysate; l) a tissue formed by cells; m) a whole virus or any of its components; n) synthetic polymers; and o) molecularly imprinted polymers (MIP).

39. (Withdrawn) A method according to claim 38, wherein the proteins capable of specifically binding to other substances are monoclonal or polyclonal antibodies.

40. (Withdrawn) A method according to claim 33, wherein said sample modifying compounds are chosen from a chemical reagent capable of binding to any of the analytes present in the sample, or one or more substances from among those mentioned in claims 38 and 39, or a combination of both.

41. (Withdrawn) A method according to claim 33 wherein the signal of the sample retained in the biosensor is amplified by a cocktail or a mixture containing one or more substances of those mentioned in claims 38 and 39.

42. (Withdrawn) A method according to claim 33, wherein said cocktail consists of one or more antibodies marked with a fluorescent substance, a metallic compound or an enzyme.

43. (Withdrawn) A method according to claim 33, wherein said cocktail consists of one or more PNA or nucleic acid fragments marked with a fluorescent substance, a metallic compound or an enzyme.